

Introduction to Data Structures

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|--------------------------------|--|---------------------------------|----------------|----------------------|--------|
| Course Code | OE2 | Year | III | Semester | II |
| Course Category | Open Elective Course/Job oriented elective | Branch | Other Branches | Course Type | Theory |
| Credits | 3 | L-T-P | 3-0-0 | Prerequisites | - |
| Continuous Evaluation : | 30 | Semester End Evaluation: | 70 | Total Marks: | 100 |

| Course Outcomes | | |
|---|---|-----------|
| Upon successful completion of the course, the student will be able to | | |
| CO1 | Understand the basic concepts of data structures. | L2 |
| CO2 | Apply suitable Linear Data Structures to solve problems. | L3 |
| CO3 | Apply suitable Non Linear data structures to solve problems. | L3 |
| CO4 | Analyze the problem and develop solution using suitable datastructures. | L4 |

| Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight) | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | | | | | | | | | | | | | |
| CO2 | 3 | | | | | | | | | | | | | |
| CO3 | 3 | | | | | | | | | | | | | |
| CO4 | | 3 | | | | | | | 3 | 3 | | | | |

| Course Content | | |
|-----------------------|--|--------------------|
| UNIT-1 | <p>Introduction: Introduction to data structures, Abstract data types (ADT).</p> <p>Array: Array element identifier and addressing formulas, One-dimensional arrays, Applications.</p> <p>Linked lists: Introduction, Single linked list, double linked list, circular linked list, and operations on linked lists.</p> | CO1,CO2,CO4 |
| UNIT-2 | <p>Linear Data Structures:</p> <p>Stacks: Definition, operations, array implementation, linked list Implementation and applications.</p> | CO1,CO2,CO4 |
| UNIT-3 | <p>Queues: Definition, operations, array implementation and applications, Circular Queue and Double ended queue (DEQUE).</p> | CO1,CO2,CO4 |
| UNIT-4 | <p>Sorting and Searching:</p> <p>Searching- Linear and Binary search algorithms.</p> <p>Sorting- Bubble, Insertion, Selection, Merge, Quick sort algorithms.</p> | CO1,CO2,CO4 |
| UNIT-5 | <p>Introduction to nonlinear data structure:</p> <p>Trees: Definition, binary tree, Properties of Binary Trees, binary tree representation, binary tree traversal.</p> <p>Graphs: Definition, Representation of graph, graph traversals.</p> | CO1,CO3,CO4 |

| Learning Resources | |
|---|---|
| Text Books | 1. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Second Edition, 2002, Pearson. |
| Reference Books | 1. Classic Data Structures, Debasis Samantra, Second Edition, 2009, PHI. |
| e-Resources & other digital material | <p>1. https://www.javatpoint.com/data-structure-array</p> <p>2. http://www.geeksforgeeks.org/data-structures/</p> <p>3. http://www.studytonight.com/data-structures/</p> |